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INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(51) International Patent Classification 7 : A24C 5/18 — A1

(11) International Publication Number: WO 00/08959

(43) International Publication Date: 24 February 2000 (24.02.00)

(21) International Application Number: PCT/GB99/02600

(22) International Filing Date: 6 August 1999 (06.08.99)

(30) Priority Data:
9817605.0 14 August 1998 (14.08.98) GB

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(81) Designated States: AE, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, CA, CH, CN, CU, CZ, DE, DK, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MD, MG, MK, MN, MW, MX, NO, NZ, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TR, TT, UA, UG, US, UZ, VN, YU, ZA, ZW, ARIPO patent (GH, GM, KE, LS, MW, SD, SL, SZ, UG, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, CH, CY, DE, DK, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GW, ML, MR, NE, SN, TD, TG).

Published
With international search report.

(54) Title: INCORPORATION OF SMOKE-MODIFYING AGENTS IN SMOKING MATERIAL RODS

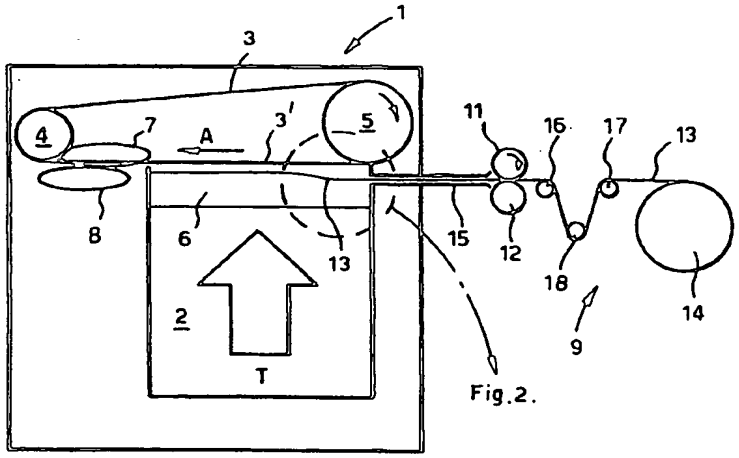

Fig.2.

(57) Abstract

A method of incorporating fibriform smoke–modifying material in smoking material rod, wherein fibriform smoke–modifying material is fed longitudinally thereof to a rod making machine (1). The longitudinal feed path in the machine is in a travel direction of the smoking material deposition run of the suction band (3) of the machine. The fibriform material (13) is either constrained by guide means (15) in the machine to follow a feed path spaced from the run (31) of the suction band against the suction force towards the run or the feed path of the fibriform smoke–modifying material is caused to ascend toward the deposition run under the influence of the suction force towards the run, until at a predetermined distance along the deposition run the fibriform material becomes supported and is subsequently maintained at a predetermined distance from the run by particulate smoking material (20) deposited on the run. Thereafter further smoking material (20') is deposited on the deposition run.

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Incorporation of Smoke-Modifying Agents in Smoking Material Rods

The present invention relates to the incorporation of fibriform material comprising smoke-modifying agents in smoking material rods.

It has heretofore been proposed to incorporate a filament comprising smoke-modifying agents in a smoking material rod, such as a tobacco rod. For example, in GB 2 070 409 it was proposed that a filament comprising smoke-modifying agents be incorporated in the smoking material rod by insertion of the filament at the tongue of the garniture of a tobacco rod making machine. As would be apparent to those skilled in the art, insertion of a filament at the tongue of the garniture would inevitably require bending of the filament, which bending may be undesirable under certain circumstances, such as when a filament of lesser flexibility is used. Furthermore, when inserting filaments at the tongue of the garniture, the precise location of the filament laterally of the resulting tobacco rod is not easily regulated and also, disadvantageously, the flow of tobacco at the garniture could be disturbed.

US 5,144,966 discloses a flavourant-release additive in the form of a filament for incorporation in the combustible filler of cigarette products and a method of production of

such a filament. In US 5,144,966 at Column 3, lines 20-23 it is stated, in respect of the incorporation of filaments in filler rod during formulation of the rod on a rod making machine, that the filament, on a reel module, can be fed continuously to the moving cigarette wrapper strip in co-ordination with the combustible filler feed stream. As is well known to those persons skilled in the art, in cigarette manufacture the cigarette wrapper strip is fed directly into the garniture of the tobacco rod making machine. US 5,144,966 clearly teaches that the filament is fed to the moving cigarette wrapper strip and thus that the filament is fed to the garniture of the tobacco rod making machine, much in the same manner as that disclosed in GB 2 070 409 above. The disadvantages of such a system, as outlined above, include the lateral positioning of the filament in the completed tobacco rod being substantially unregulated and the introduction of inflexible filaments being difficult.

The present invention is predicated upon Applicant's realisation that it is important that when a smoke-modifying agent is incorporated in a tobacco rod such as to be distributed along the rod, the agent is located at an axial zone of the rod. Such axial zone location of the agent ensures maximal transfer efficiency of the agent into mainstream smoke. Furthermore, the location of the agent at an axial zone of the rod ensures a minimal propensity of spot

formation on the tobacco rod wrapper. In addition, ash formation in cigarettes comprising a tobacco rod having a smoke-modifying agent at an axial zone thereof resembles that of conventional cigarettes.

US 4,219,031 teaches a method of making a smoking article, which smoking article comprises a gas permeable, self-supporting central core consisting essentially of a carbonised cellulose rod, which core is circumscribed by tobacco. Reference is made in Column 5, line 19 to the feeding of a carbonised rod into cigarette fabricating equipment, which equipment, it is said, acts to arrange cut tobacco shreds around the periphery of the core (rod). However, there is no teaching as to how this could be achieved practically.

Finally, in US 4,727,888 a method is disclosed for making a smoking article rod, for which method two tobacco rod making machines are juxtaposed with the respective garnitures in alignment. The first making machine produces a tobacco rod the diameter of which is smaller than that of a conventional cigarette. This small diameter tobacco rod is then fed from the first making machine directly into the second making machine, in which further tobacco is fed to and around the small diameter rod and a paper wrapper is applied about the layer of further tobacco, thus to form a coaxial tobacco rod of conventional exterior circumferential dimension.

It is an object of the present invention to provide for the improved and commercially practical incorporation of fibriform smoke-modifying material in a smoking material rod.

The present invention provides, according to a first aspect thereof, a method of incorporating fibriform smoke-modifying material in smoking material rod, wherein fibriform smoke-modifying material is fed longitudinally thereof to a rod making machine, the longitudinal feed path in said machine being in a travel direction of the smoking material deposition run of the suction band of said machine, said feed path of said fibriform smoke-modifying material being caused to ascend towards said deposition run under the influence of the suction force towards said run until at a predetermined distance along said deposition run said fibriform material becomes supported and is subsequently maintained at a predetermined distance from said run by particulate smoking material deposited on said run, thereafter further said smoking material being deposited on said run.

The present invention further provides, according to a second aspect thereof, a method of incorporating fibriform smoke-modifying material in smoking material rod, wherein fibriform smoke-modifying material is fed longitudinally thereof to a rod making machine, the feed path in said machine extending in the travel direction of the smoking material deposition run of the suction band of said machine, said

fibriform material being constrained by guide means in said machine to follow said feed path spaced from said run of said suction band against the suction force towards said run until at a predetermined distance along said deposition run said fibriform material becomes supported and is subsequently maintained at a predetermined distance from said run by particulate smoking material deposited on said run, thereafter further said smoking material being deposited on said run.

The fibriform smoke-modifying material suitably takes the form of a single, continuous, fibriform element. Alternatively, in respect of the second aspect of the present invention the fibriform smoke-modifying material could be fed to and into contact with the particulate smoking material in the form of a sequence of discrete fibriform elements. In the latter case each element, in the feed path of the elements, may be at each end thereof in contact with the respective ends of the next adjacent elements of the sequence thereof, or may be spaced therefrom.

In that particulate smoking material is deposited on the deposition run of the suction band both before and after the fibriform smoke-modifying material becomes supported at, or substantially at, the said predetermined distance from the run by smoking material on the run, in the carpet of smoking material as finally formed at the downstream end of the run the element(s) is disposed other than at the upper or lower

boundary of the carpet. The position of the element(s) relatively of the upper and lower boundaries is determined in accordance with the location along the deposition run of the suction band at which the element(s) becomes supported by the smoking material deposited on said run. Suitably, the said location is selected to be in a mid zone of that portion of the deposition run which extends from the location at which smoking material is first deposited on the deposition run to the downstream location at which the carpet of smoking material is finally formed, i.e. the location at which deposition is terminated. Thus, for example, the said location may be situate between about 25% and about 60% of the length of the said portion of the deposition run as taken from the location at which smoking material is first deposited on the run, and preferably between about 25% and about 40% of that length.

Suitably too, if the fibriform smoke-modifying material takes the form of a single only, continuous fibriform element, the feed path of the fibriform element in the making machine is aligned, or substantially aligned, with the plan view longitudinal centre line of the carpet on the deposition run of the suction band; that is to say, the element is, throughout the feed path thereof in the making machine, equi-distant, or substantially equi-distant, the suction band guide rails of the machine. As will be readily apparent to those of

ordinary skill in the art, if two, say, continuous fibriform elements are fed to the making machine, the respective feed paths thereof are in the proximity of the said longitudinal centre line of the carpet. By virtue of the said location being appropriately positioned in a mid zone of the said portion of the deposition run, and, in the case of a single element, the element being aligned with the aforesaid plan view centre line of the carpet, it may be readily arranged that the element extends axially of the subsequently formed smoking material rod.

According to the first aspect of the present invention the degree of ascent of the feed path of the fibriform smoke-modifying material is preferably only gradual (for example not more than about 5° from the horizontal, and preferably about 1° to 2° from the horizontal). As will be realised by those skilled in the art, the degree of rigidity of the fibriform smoke-modifying material is to be selected such that the fibriform material is not, upon being exposed to said suction force, thereby immediately displaced upwardly onto the run of the suction band, but maintains a gradual ascent until at said predetermined distance along said deposition run the fibriform smoke-modifying material becomes supported by particulate smoking material deposited on the run. As will also be readily appreciated by persons skilled in the art, an important variable in ensuring that the fibriform smoke-

modifying material initially becomes supported by the particulate smoking material deposited on said run at said predetermined distance along said deposition run is the distance between said fibriform smoke-modifying material at the point of entry thereof to the chimney of the making machine and the deposition run of the suction band.

According to the second aspect of the present invention, the feed path to which the fibriform smoke-modifying material is constrained by the guide means may extend at a constant vertical distance from the deposition run of the suction band. Alternatively, the guide means is so configured that the feed path ascends towards the deposition run, in which case the guide means terminates at the aforesaid distance from the deposition run, or somewhat short thereof. The path of ascent can be linear or, alternatively, the path of ascent can be curvilinear, an ogee curve for example.

Also, preferably the guide means of the second aspect of the present invention comprises rigid, elongate body means, which body means is provided with a guidance bore. The guidance bore is configured and dimensioned so as to ensure unimpeded movement through the bore of fibriform smoke-modifying material. Suitably, the elongate body is of generally tubular conformation. Thus, for example, the elongate body may take the form of a tube, the exterior diameter of which tube is suitably within a range of about

0.5mm to about 3mm in a case in which the fibriform smoke-modifying material takes the form of a single fibriform element. Conveniently, the exterior diameter of the tube is about 1.5mm where it is the case that the single fibriform element is of an exterior diameter of about 0.5-1mm. Thus it may be that the elongate body generally resembles a syringe needle.

Instead of the guidance bore being dimensioned appropriately for the movement therethrough of a single fibriform element, in the case in which two or more elements are fed simultaneously to the making machine, a single, larger guidance bore may be employed for the guided movement therethrough of the two or more elements in side-by-side disposition. Alternatively, each of the two or more elements is guided in a respective bore of a plurality of guidance bores. A single or plurality of elongate body means may provide the plurality of guidance bores.

Advantageously, the exterior conformation of the single elongate body means or the plurality thereof of the guide means is such as to minimise the obstacle presented, by the presence of the body means, to the flow of particulate smoking material to the deposition run of the suction band of the making machine. Thus, for example, a streamlined fairing may be provided, which fairing extends upwardly and/or downwardly of the elongate body means. Alternatively, or in addition,

the flow of smoking material to the deposition run in the region of the guide means is aided by the provision of a modified flow path boundary configuration. Thus in the vicinity of the guide means the flow path to each side thereof may be enlarged, i.e. the lateral distance between the guide means and the path boundary to each side thereof is increased. In addition or as an alternative to these measures, the degree of suction at that portion of the deposition run overlying the guide means is modified relatively to that obtaining at the remainder of the deposition run. The degree of suction exerted in way of the guide means may, for example, be maintained at an elevated level and/or may be continuously varied.

Advantageously, the fibriform smoke-modifying element(s) is conveyed continuously to the point of entry to the rod making machine by feed means. The feed means may comprise a pair of opposed feed rollers, which rollers are operable to draw a fibriform element from a wound storage source thereof. Suitably, the speed of at least one of the feed rollers can be varied relative to speed of the rod making machine. Thus, the fibriform element is fed to the rod making machine at a fixed speed in relation to that at which the rod making machine is run.

In order that the present invention may be clearly understood and readily carried into effect, reference will now

be made, by way of example, to the accompanying diagrammatic drawings, in which:-

Figure 1 shows an upstream section of a tobacco rod making machine and associated equipment according to the first aspect of the present invention;

Figure 2 shows an enlarged longitudinal section of an upstream portion of the guide rails and associated equipment of the apparatus shown in Figure 1;

Figure 3 shows an upstream section of a tobacco rod making machine and associated equipment according to the second aspect of the present invention;

Figure 4 shows a transverse section, to an enhanced scale, taken at the guide rails and at section II-II of Figure 3 looking in the direction of the arrows;

Figure 5 corresponds to Figure 4, but depicts a somewhat different arrangement of parts;

Figure 6 shows an enlarged longitudinal section of an upstream portion of the guide rails and associated equipment according to an alternative arrangement in accordance with the second aspect of the present invention; and

Figure 7 shows an enlarged longitudinal section of an upstream portion of the guide rails and associated equipment according to a further alternative arrangement in accordance with the second aspect of the present invention.

Reference numerals are, wherever possible, consistent between the Figures.

In Figures 1 and 3, reference number 1 designates generally a tobacco rod making machine, only an upstream portion of which is shown. The making machine 1 comprises the well known features of an upwardly extending tobacco-feed chimney 2, a foraminous metallic suction band 3 trained about rollers 4 and 5 (one of which is a drive roller), a trough guide 6 and ecreteurs 7 and 8.

In operation of the making machine 1, particulate smoking material in the form of filamentary cut tobacco filler is fed continuously to the lower end of the chimney 2 by conventional feed means (not shown) of the machine 1 and flows upwardly within the chimney 2 (as indicated by arrow T) in an air flow which is maintained under the action of a vacuum which is maintained above lower (deposition) run 3' of the foraminous suction band 3 (thus to produce an upward suction force). At the trough guide 6 the filler is deposited on the underside of the lower run 3' of the suction band 3 and is transported, as a carpet, on the band 3, forwards (leftwards viewing Figures 1 and 3, i.e. in the direction of arrow A) to the location of the ecreteurs 7 and 8, which serve to trim filler from the carpet. As is well known to those skilled in the art, downstream of the ecreteurs 7 and 8 the tobacco carpet is fed into a garniture (not shown) of the making machine 1 under the

action of a transporting garniture band (also not shown) which acts, in addition, to feed a continuous web of cigarette paper to the garniture. The garniture serves to enwrap the tobacco in the cigarette paper web to provide a continuous tobacco rod. Signals from a rod density monitoring means (also not shown) downstream of the garniture cause position changes of the ecreteurs 7 and 8 such that the amount of tobacco trimmed from the carpet on the suction band 3 is that requisite to maintain the density of the cigarette rod within specified tolerance limits.

In Figures 1 and 3 respectively reference numerals 9 and 10 designate generally feed means operable to feed continuously fibriform element 13 to the making machine 1, which feed means 9,10 comprise a pair of opposed feed rollers 11, 12. The feed roller 12 is a spring-loaded, non-driven roller, which roller applies a force to the element 13 without deforming the element 13. The feed roller 11 is driven by a servo motor (not shown). Feed rollers 11 and 12 draw the continuous fibriform element 13 from a spool 14 upon which spool 14 the continuous element 13 is wound.

The speed of the feed rollers 11, 12 can be altered by the servo motor. The servo motor is connected electronically to a controller (also not shown), which controller monitors the speed of the driven feed roller 11 in relation to a speed reading received from an encoder device (not shown) which

measures the speed of rotation of a drive wheel (not shown) operable to drive an endless garniture tape or belt (also not shown) at the garniture region (also not shown) of the tobacco rod making machine 1. In this manner it is ensured that, the linear speed of the fibriform element 13 being fed to the rod making machine 1 is maintained the same as that of the fully formed tobacco rod issuing from the garniture of the rod making machine 1.

In Figure 1, the feed rollers 11, 12 feed the continuous fibriform element 13 into a feed tube 15, the mouthpiece of the feed tube 15 being at the nip of the first and second feed rollers 11, 12. The feed tube 15 can be of any suitable length, for example the feed rollers 11, 12 may be substantially juxtaposed with the rod making machine 1 (as depicted in Figure 1), with the length of the feed tube 15 thus being relatively short. However, alternatively the feed rollers 11, 12 may be remote from the rod making machine 1 and thus the length of the feed tube 15 would be considerably longer. Preferably, the feed tube 15 has a circular cross-sectional conformation having an inner diameter of typically about 1.1mm when the fibriform element 13 transferred therethrough has an outer diameter of about 1.0mm.

In order to regulate the speed at which the fibriform element 13 is fed from the spool 14 a brake system may be positioned between the spool 14 and the feed rollers 11, 12

(see Figure 1). The brake system comprises three rollers (16, 17, 18, two of which, 16, 17, are idling rollers and the third of which, roller 18, is mounted on a spring lever (not shown) and is capable of acting via the lever as a brake in respect of the spindle (not shown) upon which the spool 14 is mounted. If the tensile force exerted by the feed rollers 11, 12 on the element 13 decreases the braking effect in regard to the spool 14 is implemented, thus to prevent a run-off of element 13 from the free running spool 14. Conversely, upon resumption of the application to the element 13 of the original tensile force, the braking effect is automatically removed.

In Figure 3, the feed rollers 11, 12 feed the continuous element 13 to and through a guide tube 19 disposed within making machine 1.

Figure 2 depicts the build-up of filamentary cut tobacco 20 on the lower run 3' of the suction band 3 and the entry of the fibriform element 13 into the trough guide 6 of the rod making machine 1. The trough guide 6 comprises first and second suction band guide rails (not shown but which resemble those depicted in Figure 5 by reference numerals 21, 22).

As is indicated by Figures 4 and 5, the guide means 19 taking the form of a straight rigid guide tube of 1.5mm exterior diameter, formed, for example, of a stainless steel extends between the guide rails 21 and 22 of the trough guide 6. Figure 4 shows a transverse section, taken at the guide

rails 21 and 22 and at section II-II of Figure 3 looking in the direction of the arrows, depicting guide rails 21 and 22 which have been modified in shape in the region of the guide tube 19 to ensure an adequate flow of air and filamentary tobacco entrained therein to the suction band 3 notwithstanding the presence of the guide tube 19. The cross-sectional configurations of the unmodified portion of the rails 21 and 22 downstream of the location of the guide tube 19, as viewed at a section taken at III-III of Figure 3 and looking in the direction of the arrows, are as per those shown for the rails 21 and 22 as depicted in Figure 5. Figure 5 further depicts a streamlined fairing 24 extending vertically downwardly from the guide tube 19 so that the flow of air and filamentary tobacco to the suction band 3 is smoothly diverted around the guide tube 19. By ensuring an adequate flow of air and tobacco to the suction band 3 in the region of the guide tube 19, there is thereby achieved the result that the presence of the guide tube 19 does not cause tobacco build-up or blockage. The presence of fairing 24 may further increase the inherent rigidity of the guide tube 19.

In Figures 6 and 7 the guide tube 19 disposed within the making machine 1 is depicted in alternative arrangements to that shown in Figure 3. In both Figures 6 and 7 the guide tube 19 ascends towards the lower run 3'. In Figure 6 the path of ascent of the guide tube 19 is of curvilinear ogeed

conformation, whereas in Figure 7 the path of ascent of the guide tube 19 is linear.

In operation of the making machine 1 and the associated feed means 9 of Figure 1, filamentary cut tobacco filler 20 (see Figure 2), entrained in conveying air, passes up the chimney 2 and is deposited on the moving lower run 3' of the suction band 3 and, simultaneously therewith, the fibriform element 13 is continuously fed forward by the feed means 9. The element 13 is fed along a feed path which extends between the guide rails of the trough guide 6. The feed tube 15 does not extend beyond side wall 23 of chimney 2 (see Figure 2).

As is well known to those skilled in the art, the depth of the carpet of filamentary tobacco 20, 20' which is deposited on the lower, deposition run 3' increases proportionately from the right to the left hand of the chimney 2 (as viewing Figures 1 and 2). In the rod making machine 1 used to exemplify the invention the trough guide 6 is of a depth of about 20mm. The fibriform element 13 is fed into the trough guide 6 via the feed tube 15 at a location approximately 7mm below the lower run 3'. As is depicted in Figure 2, the fibriform element 13 ascends towards the lower run 3' under the influence of the aforesaid suction force until, at a distance which approximates to 30% of the width of the chimney as taken from the location at which tobacco 20 is first deposited on the run 3', i.e. at the right hand of the

chimney as viewing Figure 2, the fibriform element 13 becomes supported, at a predetermined distance from the run 3', by the tobacco 20 deposited on the run 3'. The element 13 is subsequently maintained at that predetermined distance from the run 3' by the tobacco 20 deposited on the run 3'. After the element has become so supported, further tobacco 20' is deposited on the run 3' and thus tobacco is disposed both above and below the element 13. Suitably, the predetermined distance from the run 3' is about 4mm in a case in which the resultant tobacco rod is of a diameter of 8mm, thereby to ensure that the element 19 is disposed coaxially of the rod. Thus, in this case the element 13 ascends a total of about 3mm over the first 30% of the width of the chimney 2.

In operation of the making machine 1 and the associated feed means 10 as depicted in Figure 3, filamentary cut tobacco filler, entrained in conveying air, passes up the chimney 2 and is deposited on the moving lower run 3' of the suction band 3 and, simultaneously therewith, the fibriform element 13 is continuously fed forwardly by the feed means 10 and in its travel in a feed path between the guide rails 21, 22 the element 13 is guided by the guide tube 19. In the travel thereof up the chimney 2 in way of the guide tube 19, the filamentary tobacco flows adequately to the run 3' of the suction band 3 by virtue of the provision of flow modifying

means, as for example, those as described above with reference to Figure 4 and/or Figure 5.

The length dimension of that portion of the guide tube 19 which extends within the chimney 2 is such that the depth of the aforesaid tobacco carpet at the location of the outlet end (the leftward end as viewing Figures 3, 6 and 7) of the guide tube 19 is substantially equivalent to the distance by which the guide tube 19, at its outlet end, is spaced from the run 3' of the suction band 3. This being the case, immediately upon the emergence thereof from the guide tube 19, the fibriform element 13 is supported by the tobacco carpet against the suction force acting towards the run 3' of the suction band 3. By virtue of the element 13 being so supported upon emergence from the guide tube 19, it is possible to ensure, by an appropriate specification of the aforesaid length dimension of the guide tube 19 in relation to the width of the chimney 2, that in the subsequently formed tobacco rod the element 13 is disposed co-axially of the rod.

CLAIMS

1. A method of incorporating fibriform smoke-modifying material in smoking material rod, wherein fibriform smoke-modifying material is fed longitudinally thereof to a rod making machine, the longitudinal feed path in said machine being in a travel direction of the smoking material deposition run of the suction band of said machine, said feed path of said fibriform smoke-modifying material being caused to ascend towards said deposition run under the influence of the suction force towards said run until at a predetermined distance along said deposition run said fibriform material becomes supported and is subsequently maintained at a predetermined distance from said run by particulate smoking material deposited on said run, thereafter further said smoking material being deposited on said run.

2. A method of incorporating fibriform smoke-modifying material in smoking material rod, wherein fibriform smoke-modifying material is fed longitudinally thereof to a rod making machine, the feed path in said machine extending in the travel direction of

the smoking material deposition run of the suction band of said machine, said fibriform material being constrained by guide means in said machine to follow said feed path spaced from said run of said suction band against the suction force towards said run until at a predetermined distance along said deposition run said fibriform material becomes supported and is subsequently maintained at a predetermined distance from said run by particulate smoking material deposited on said run, thereafter further said smoking material being deposited on said run.

3. A method according to Claim 1 or 2, wherein said fibriform smoke-modifying material takes the form of a single, continuous, fibriform element.

4. A method according to Claim 2, wherein said fibriform smoke-modifying material is fed to and into contact with said particulate smoking material in the form of a sequence of discrete fibriform elements.

5. A method according to any one of the preceding claims, wherein said predetermined distance along said deposition run is selected to be in a mid zone of that portion of said deposition run which extends from the location at which smoking material is first

deposited on said run to the downstream location at which the smoking material deposition is terminated.

6. A method according to Claim 5, wherein said predetermined distance along said deposition run is located between about 25% and about 60% of the length of said portion of said deposition run as taken from the location at which smoking material is first deposited on said run.

7. A method according to Claim 6, wherein said predetermined distance along said deposition run is located between about 25% and about 40% of said length.

8. A method according to Claim 1 or any one of Claims 3, 5, 6 or 7 as appended to Claim 1, wherein the degree of ascent of said feed path of said fibriform smoke-modifying material is not more than about 5° from the horizontal.

9. A method according to Claim 2 or any one of Claims 3 to 7 as appended to Claim 2, wherein that portion of said feed path which extends beneath said deposition run extends at a constant vertical distance from said deposition run of said suction band.

10. A method according to Claim 2 or any one of Claims 3 to 7 as appended to Claim 2, wherein said guide

means is so configured that said feed path ascends towards said deposition run.

11. A method according to Claim 10, wherein the path of ascent is linear.

12. A method according to Claim 10, wherein the path of ascent is curvilinear.

13. A method according to Claim 2 or any of Claims 9 to 12, wherein said guide means comprises rigid, elongate body means, which body means is provided with a guidance bore.

14. A method according to Claim 13, wherein said body means is a tube of an exterior diameter of about 0.5mm to about 3mm.

15. A method according to Claim 2 or any one of Claims 3 to 7 or 9 to 14 as appended to Claim 2, wherein streamlined fairing means extends upwardly and/or downwardly of said guide means.

16. A method according to Claim 2 or any one of Claims 3 to 7 or 9 to 15 as appended to Claim 2, wherein in the vicinity of said guide means the flow path of said smoking material to said deposition run is enlarged to each side of said guide means.

17. A method according to Claim 2 or any one of Claims 3 to 7 or 9 to 16 as appended to Claim 2, wherein the degree of suction at that portion of said deposition

run overlying said guide means is modified relatively to that obtaining at the remainder of said deposition run.

18. A method according to any one of the preceding claims, wherein said fibriform element is fed to said rod making machine at a fixed speed in relation to that at which said rod making machine is run.

Fig.1.

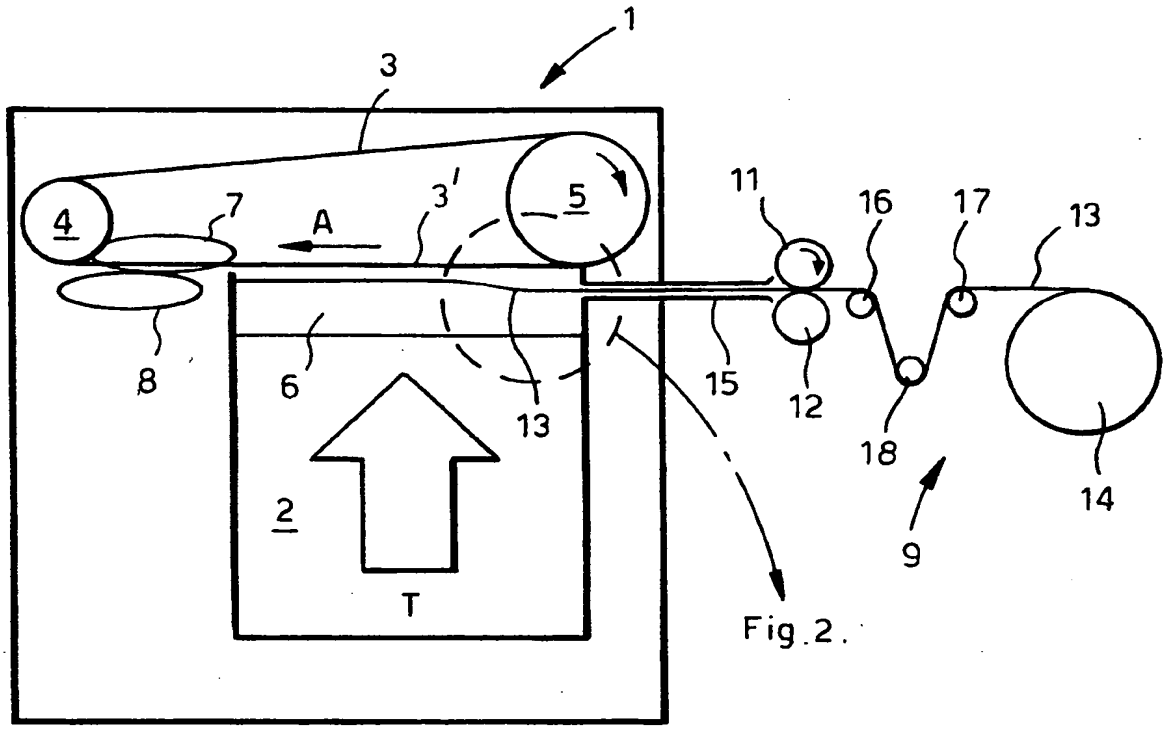


Fig.2.

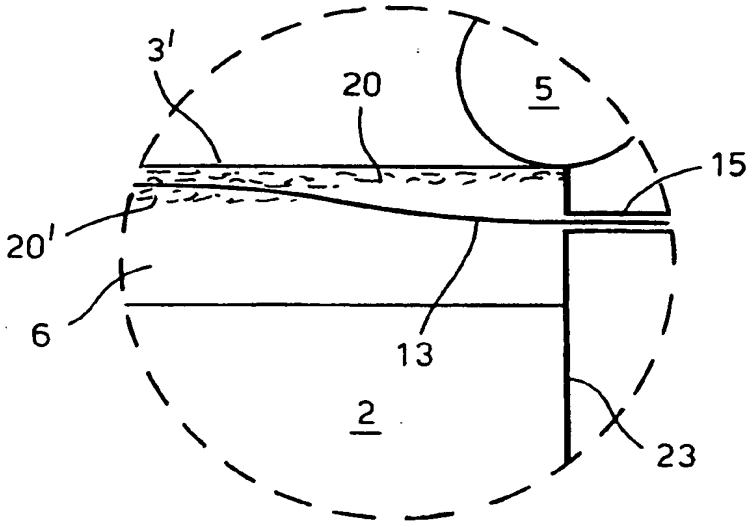


Fig.4.

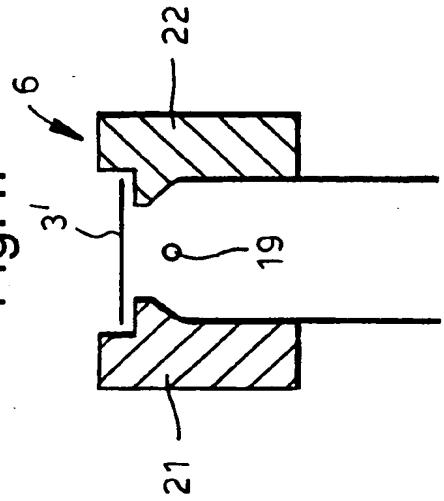


Fig.5.

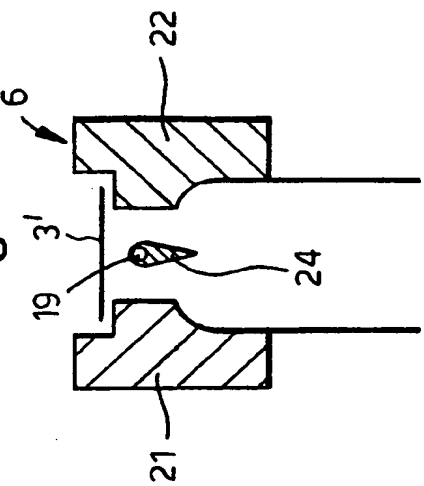


Fig.3.

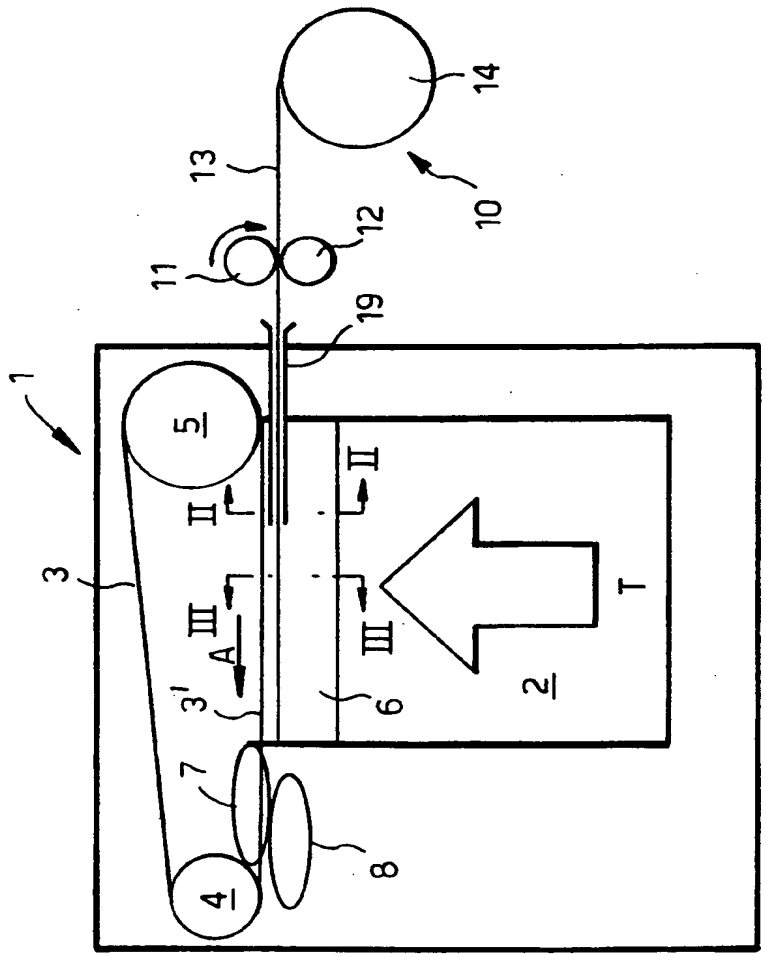


Fig.6.

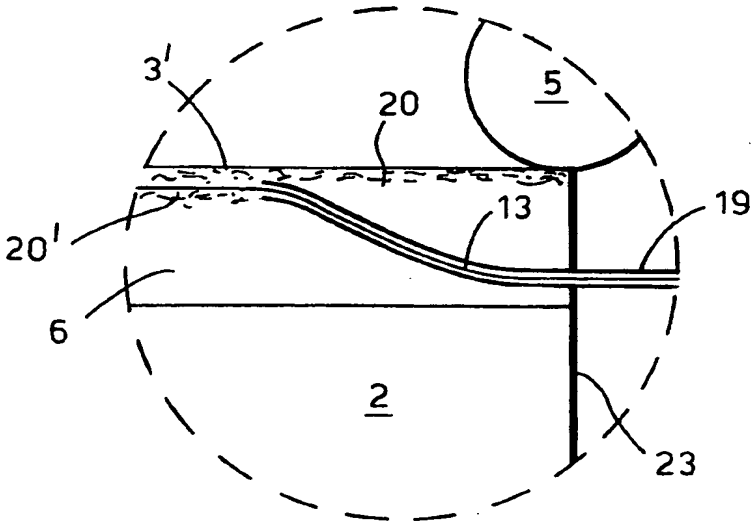
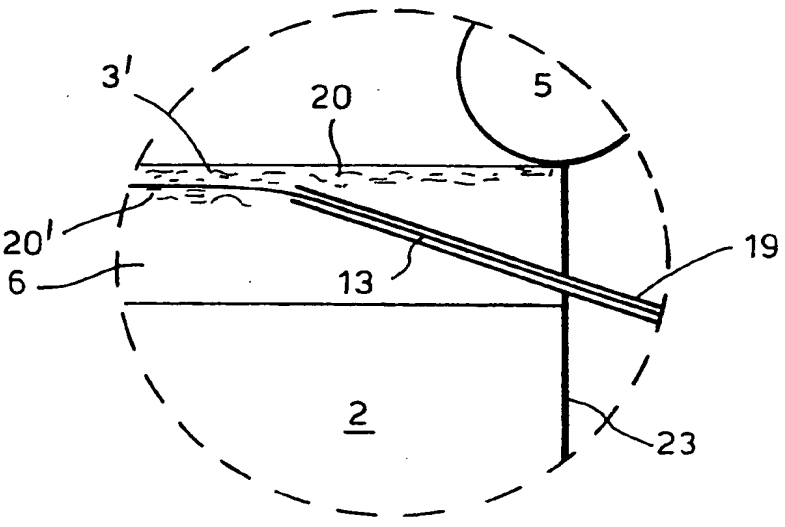


Fig.7.



INTERNATIONAL SEARCH REPORT

Intern ıal Application No
PCT/GB 99/02600

A. CLASSIFICATION OF SUBJECT MATTER
IPC 7 A24C5/18

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)
IPC 7 A24C A24D

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practical, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
A	GB 2 260 887 A (ROTHMANS INTERNATIONAL TOBACCO LIMITED) 5 May 1993 (1993-05-05) page 12, line 27 -page 14, line 2; figures 13,14	1-5,9
A	EP 0 558 447 A (FABRIQUES DE TABAC REUNIES S.A.) 1 September 1993 (1993-09-01) column 5, line 20 - line 47; figure 4	1-3
A	GB 2 070 409 A (BRITISH-AMERICAN TOBACCO COMPANY LIMITED) 9 September 1981 (1981-09-09) cited in the application the whole document	1,2
A	EP 0 405 929 A (PHILIP MORRIS PRODUCTS INC.) 2 January 1991 (1991-01-02)	

☐ Further documents are listed in the continuation of box C.

☒ Patent family members are listed in annex.

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"O" document referring to an oral disclosure, use, exhibition or other means

"P" document published prior to the international filing date but later than the priority date claimed

"T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

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Date of the actual completion of the international search	Date of mailing of the international search report
16 November 1999	22/11/1999

Name and mailing address of the ISA	Authorized officer
European Patent Office, P.B. 5818 Patentlaan 2 NL – 2280 HV Rijswijk Tel. (+31–70) 340–2040, Tx. 31 651 epo nl, Fax: (+31–70) 340–3016	Riegel, R

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INTERNATIONAL SEARCH REPORT

Information on patent family members

Intern ıal Application No
PCT/GB 99/02600

Patent document cited in search report	Publication date	Patent family member(s)	Publication date
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EP 405929 A	02-01-1991	US 4993434 A	19-02-1991
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